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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/514,526	02/28/2000	Donald S. Farquhar	END000006US1	8922

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EXAMINER	
SMETANA, JIRI F	
ART UNIT	**PAPER NUMBER**
1746	9

DATE MAILED: 05/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

T-D-9

Office Action Summary	Application No.	Applicant(s)	
	09/514,526	FARQUHAR ET AL.	
	Examiner	Art Unit	
	Jiri F. Smetana	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 March 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's arguments traversing the restriction requirement have been considered but are moot in view of Applicant's cancellation of the non-elected invention (claims 1-17) in Paper No. 8. An Office action on the elected claims follows.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Geshner et al., U.S. Patent No. 4,105,468.

The claimed invention reads on Geshner as follows: Geshner discloses an electrical structure comprising a chromium volume, an iron-comprising body in continuous electrical contact with the chromium volume, and an acid solution in continuous contact with both the chromium volume and the iron-comprising body, wherein the chromium body is being etched at an etch rate; wherein the electrical structure further comprises a chromium oxide layer on the chromium volume (column 1, lines 34-46); wherein the acid solution includes a hydrochloric acid in a liquid bath form (Table 1; column 3, line 57 - column 4, line 2); wherein the acid solution includes hydrochloric acid in spray form (Table 1; column 3, lines 15-28); and wherein the

chromium volume includes a layer of chromium over a layer of conductive metal (column 1, lines 39-44).

The elements in the claims are read in the reference.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 21 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Geshner in view of Innokent, U.S. Patent No. 3,630,795.

Recitation of Geshner is repeated here from above.

In the event that Applicant disagrees with Examiner's interpretation of Geshner, Innokent discloses wherein the acid solution is in spray form (column 2, lines 55-73).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the invention of Geshner in view of Innokent because Innokent teaches that micron sized fine lines can be patterned in thin films by spraying an etchant on the metallic film (column 1, lines 43-71).

6. Claims 22-25, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geshner as applied to claims 18-21 above, in view of Abolafia et al., U.S. Patent No. 4,370,197.

Recitation of Geshner is repeated here from above.

Geshner does not disclose wherein the chromium volume includes a layer of chromium on a layer of conductive metal nor wherein the temperature and molarity of the hydrochloric acid is within a triangle space defined by temperature (T) and molarity (M) points of (21°C, 2.4M), (52°C, 2.4M), and (52°C, 1.2M). However, Abolafia discloses wherein the chromium volume includes a layer of chromium on a layer of conductive metal of copper (column 1, lines 17-23), wherein the conductive metal of copper is in contact with the acid solution of HCl (column 1, lines 38-40), wherein the temperature and molarity of the hydrochloric acid is within a triangle space defined by temperature (T) and molarity (M) points of (21°C, 2.4M), (52°C, 2.4M), and (52°C, 1.2M) (column 1, lines 23-32, 44-47; column 2, lines 32-39), and wherein the etching time to remove 800 angstroms of chromium is about 30 seconds (≈26.5 angstroms/second) (column 2, line 68 - column 3, line 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the invention of Geshner in view of Abolafia because Abolafia teaches that the disclosed compositions are suitable for selectively etching chrome layers without affecting the underlying copper conductive layer (column 2, lines 25-39) and that it is known to etching chromium effectively in hydrochloric acid when the chromium is in contact with copper (column 1, lines 17-23).

As to claim 22, it would have been obvious to etch the chromium volume by contacting the chromium volume with an iron-comprising body of steel because steel itself is commercial iron which merely contains trace amounts of carbon as an alloying constituent. One would have expected to arrive at the same result by contacting the

chromium volume with either an "iron-comprising body" or an "iron-comprising body [which] includes steel" because of the inherent physical, electrical, and structural similarities and properties of both conventional materials. Unless Applicant can show unexpected results, etching the chromium volume with a steel body would have been obvious. The use of conventional materials to perform their known functions in a conventional process is obvious. *In re Raner* 134 USPQ 343 (CCPA 1962).

7. Claims 22-25, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geshner and Abolafia, in view of Ricks et al., U.S. Patent No. 4,366,034.

Recitation of Geshner and Abolafia is repeated here from above.

Neither Geshner nor Abolafia explicitly disclose wherein the iron-comprising body is steel. However, Ricks discloses wherein the iron-comprising body is steel (column 1, lines 23-28).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to etch the chromium volume by contacting the chromium volume with an iron-comprising body of steel because Ricks teaches that good adhesion to the steel body will result by activation of reverse etching in a chrome plating solution (column 1, lines 23-28).

8. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Geshner as applied to claims 18-21 above in view of Blonder et al., U.S. Patent No. 5,149,404.

Recitation of Geshner is repeated here from above.

Geshner does not explicitly disclose a fluoropolymer dielectric volume bonded to the chromium volume. However, Blonder discloses wherein a photoresist volume is bonded to the chromium volume (column 1, lines 20-38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to bond a fluoropolymer dielectric volume to the chromium volume because fluoropolymer dielectric materials are conventionally used as photoresist masks in the etching of metallic films and the integrated electrical circuit fabrication industry and Blonder teaches that reticle masks made of chromium are ordinarily patterned by a radiation photoresist (column 1, lines 20-38). The use of conventional materials to perform their known functions in a conventional process is obvious. *In re Raner* 134 USPQ 343 (CCPA 1962).

9. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geshner as applied to claims 18-21 above, in view of Bulger et al., U.S. Patent No. 4,344,223.

Recitation of Geshner is repeated here from above.

Geshner does not disclose a layer of conductive metal on the layer of chromium, wherein the conductive metal includes an opening extending through its thickness, wherein the opening exposes the layer of chromium. However, Bulger discloses a layer of gold over chromium acting as an etching mask, wherein the hydrochloric acid solution is in contact with the chromium volume (column 5, lines 31-38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Geshner in view of Bulger because Bulger teaches that

the gold layer over the chromium volume is an effective mask when etching a pattern in the chromium volume (column 5, lines 31-38) and results in reliable, precise thin film components (column 1, lines 52-65). As to the limitation of wherein the iron-comprising body includes steel, it would have been obvious to etch the chromium volume by contacting the chromium volume with an iron-comprising body that is steel because Geshner teaches an iron-comprising body and one of ordinary skill in the art would have arrived at the same expected results, simply because steel is commercial iron that contains trace amounts of carbon as an alloying constituent. Unless Applicant can show unexpected results, etching the chromium volume with a steel body would have been obvious.

Response to Arguments

10. Applicant's arguments with respect to claims 18-25 and 28-30 have been considered but are moot in view of the new ground(s) of rejection.

Response to Amendment

11. Claims 1-17 have been cancelled per Applicant's request.

12. Rejection of claims 19, 24, and 25 under 35 U.S.C. 112, second paragraph, is withdrawn pursuant to Applicant's amendment.

13. The indicated allowability of claims 26 and 27 is withdrawn in view of the newly discovered reference(s) to Geshner et al. (U.S. Patent No. 4,105,468) and Bulger et al. (U.S. Patent No. 4,344,223).

14. Claims 18-30 are rejected.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jiri F. Smetana whose telephone number is (703)605-1173. The examiner can normally be reached on Monday-Friday (7:30am-4:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703)608-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

Jiri F. Smetana
Patent Examiner
Art Unit 1746

jfs
May 3, 2002

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